

in frame with a fusion gene encoding an intein and a binding protein domain wherein the intein is selected from a naturally occurring intein, an intein derivative and an intein mutant modified intein; and

introducing the plasmid into a host cell for expressing the recombinant precursor protein.

18. The method of claim 17, wherein the binding protein encoded by the nucleic acid is a chitin binding protein.

22. A method of ligating a synthetic peptide in vitro to an inactive protein so as to restore protein activity, comprising:

- (a) expressing in a host cell, the protein fused to one of an intein, an intein derivative or an intein mutant intein, wherein the intein is capable of thiol induced cleavage;
- (b) inducing intein mediated cleavage of the protein by adding a thiol reagent so as to form a C-terminal thioester on the protein;
- (c) preparing a synthetic peptide having an N-terminal cysteine; and
- (d) ligating the inactive form of the protein to the synthetic peptide to restore protein activity.

25. A method of labeling a target protein, comprising: